

Monterey Bay shallow seafloor habitat

Monterey Bay is one of the only areas within California state waters where the practice of bottom trawling is still allowed. According to the National Academy of Sciences (2002) bottom trawling reduces habitat complexity and biodiversity and is particularly damaging in areas with long-lived slow growing species like deep sea corals and sponges. In Monterey Bay, NOAA trawl surveys have documented gorgonian corals, sea pens and sponges. Submersible dives by MBARI have documented bubblegum corals, black corals, and bamboo corals. The California Academy of Sciences has collected samples of hydrocorals, *Plumerella sp.*, *Callogorgia sp.*, *Paragorgia sp.*, and bamboo corals. In an area with such known concentrations of living seafloor habitat, the risk of destroying these important ecosystem features is far too great. Bottom trawling is not a compatible activity with the known habitat complexity and diversity of Monterey Bay.

Bottom trawling is by far the most destructive human activity threatening marine habitat in the Central Coast MLPA study area. The National Academy of Sciences (2002) Report on *The Effects of Bottom Trawling and Dredging on Seafloor Habitat* reflects the worldwide scientific consensus that bottom trawling reduces the productivity, biodiversity, and complexity of benthic habitats. This is corroborated by a study on the California Central Coast by Engel and Kvitek (1998) which found that intensive trawling significantly decreases epifaunal invertebrate densities, physical habitat heterogeneity and biodiversity. These findings illustrate that allowing bottom trawling in the Central Coast is directly contrary to the goals of the MLPA and common sense.

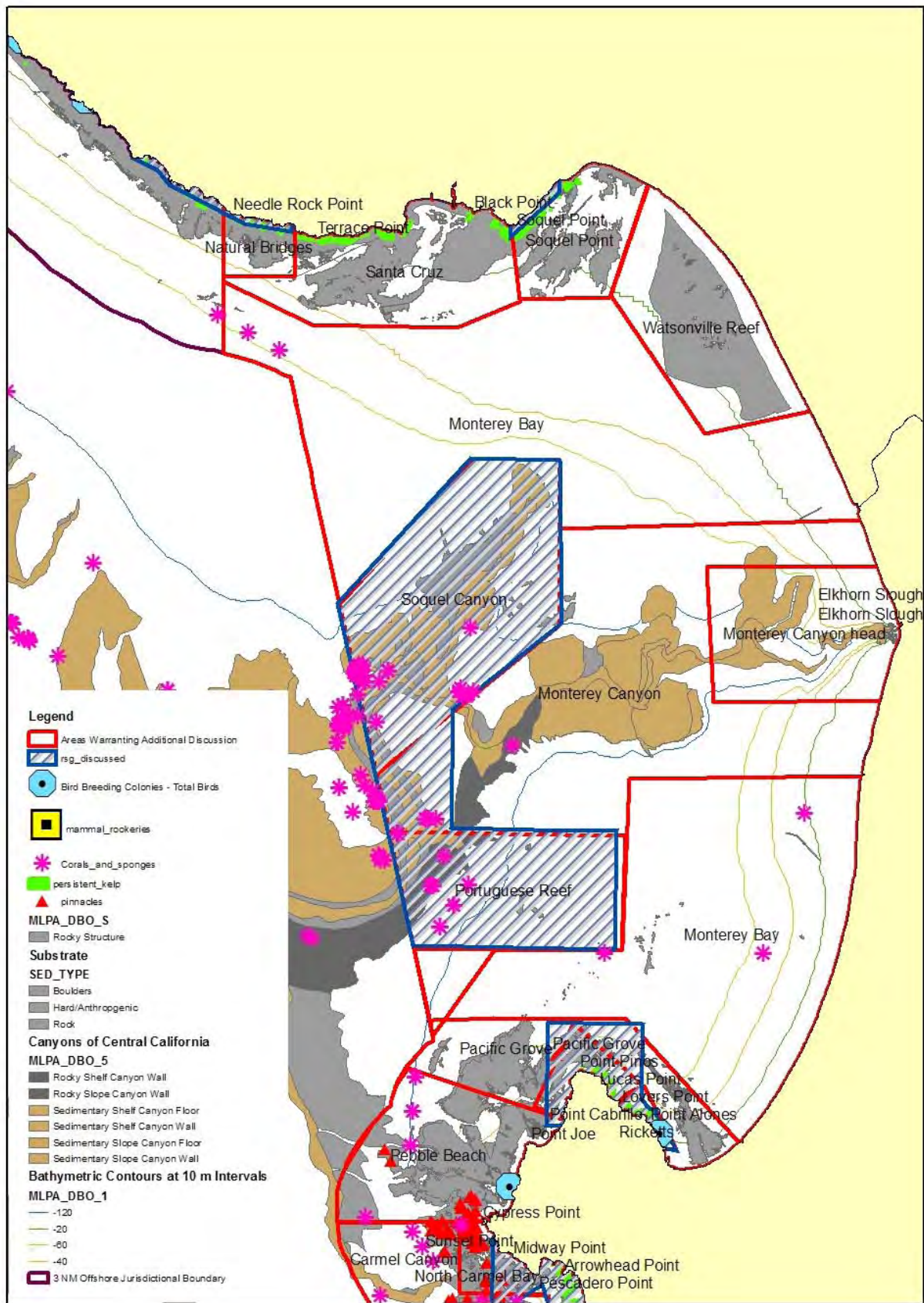
Recent actions including the passage of Senate Bill 1459 by the California State Legislature and the Pacific Fishery Management Council (PFMC) decision on Essential Fish Habitat (EFH) resulted in extensive bottom trawl closures throughout California. In the MLPA study region, state waters are closed out to 3 nm from shore. In addition, the Monterey Canyon closure by the PFMC closed some sections of Monterey and Soquel Canyons to bottom trawling. However, a large area within the MLPA Central Coast study region in state waters remains open to bottom trawling. Available coarse and fine-scale data in the current MLPA process shows that while some of these open areas is likely to be soft substrate, there are significant rocky reefs, hard bottom habitats, and submarine canyon habitats in these remaining open areas. Furthermore, fine-scale substrate data is only available for a small portion of these open areas, and has revealed hard substrates in many other areas that do not appear in the coarse dataset. In other words, the areas open to bottom trawling in the MLPA study area are known to contain habitats that are easily damaged by bottom trawl gear and likely contain many more.

Monterey Bay is an internationally significant marine ecosystem. Its functioning depends on the quality of its habitats from the deep canyons to the shoreline. Given the importance of this area and the recognition of sciences and the State of California that bottom trawling should not be allowed in state waters, we propose that bottom trawling be prohibited throughout the Central Coast study area. To address the localized socioeconomic impacts that this prohibition may cause on bottom trawl fishermen, we recommend that the bottom trawl capacity reduction take place through buyouts and gear transfers.

Recommended Management Measures

No bottom trawling in Monterey Bay state waters

Map 4: Monterey Bay



Santa Cruz Reefs

The northern section of Monterey Bay contains extensive rocky reefs and diverse shoreline types. The area contains the only documented larval retention area off Soquel Point.

Key Ecological Features

- Rocky intertidal
- Multiple rocky reefs
- High fish/bird diversity
- San Lorenzo River freshwater plume
- Kelp forests

Potential Anthropogenic Impacts

- Commercial fishing
- Recreational fishing
- Kelp harvesting
- Seafloor bottom contact
- Coastal runoff

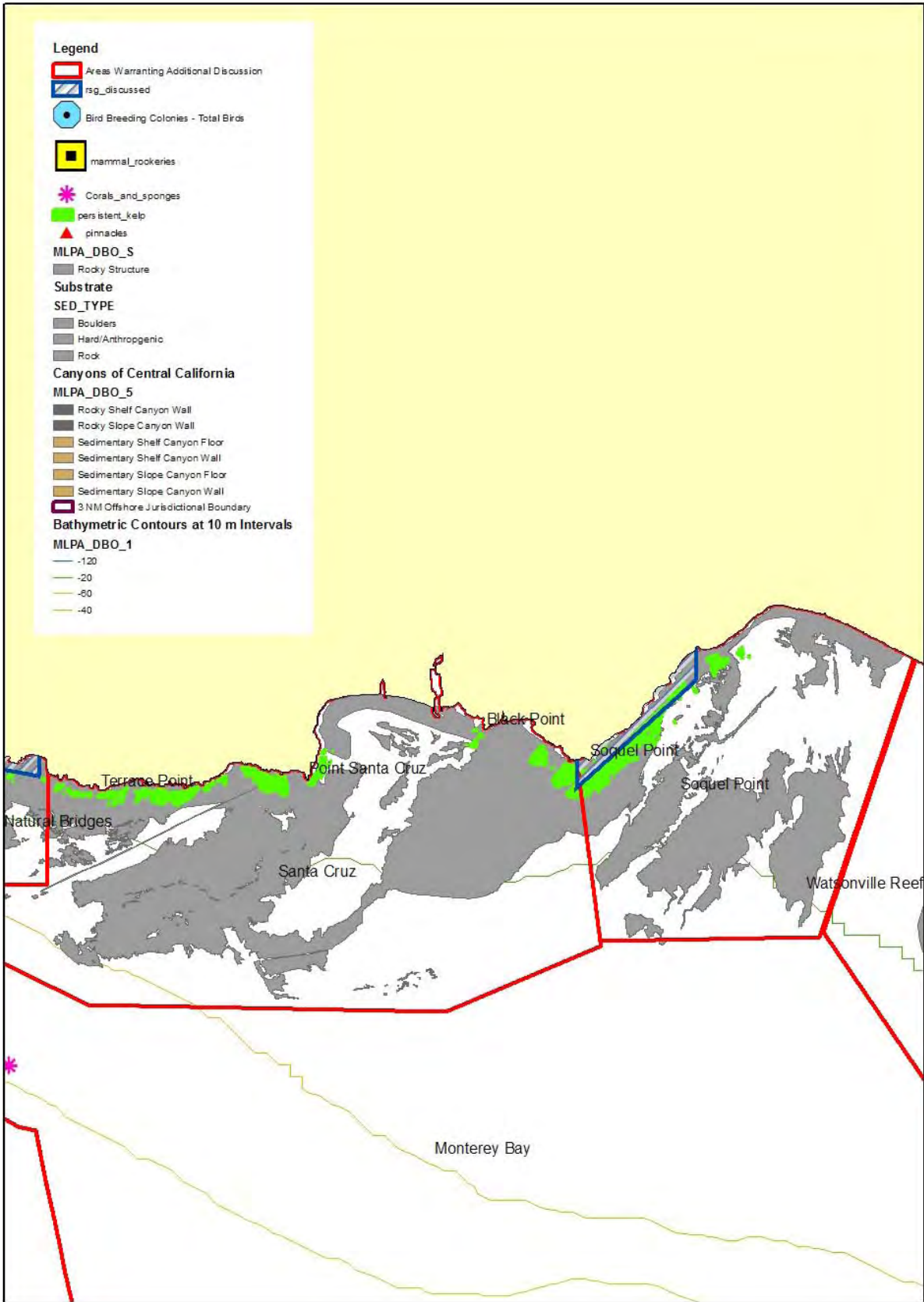
Management Objectives

- Protect seafloor and other biogenic habitat
- Protect benthic invertebrates and groundfish
- Protect forage base for top predators
- Improve water quality

Recommended Management Measures

- Coastal Pelagic Species harvest prohibited
- Commercial groundfish harvest prohibited
- Recreational groundfish take limited and monitored to ensure production of large, old, reproductive fish as identified by Berkley et al. (2004)
- Bottom contact with commercial fishing gear prohibited
- Commercial kelp harvest prohibited
- Harvest of clams and other mollusks prohibited

Map 5: Santa Cruz Reefs



Monterey Canyon benthic habitat

Monterey Canyon is the largest submarine canyon on the west coast of North America. This canyon is 470 km long, approximately 12 km wide at its widest point, and has a maximum rim to floor relief of 1700 m, making it much larger than Arizona's Grand Canyon. Soquel Canyon is an important area for several species of rockfish as well as pelagic species. These canyons contain by far the highest number and density of coral and sponge records in the Central Coast study area.

Key Ecological Features

- Major canyonhead
- Shark habitat
- Adjacent to major estuary
- High fish/bird diversity
- Corals and sponges
- Largest submarine canyon on west coast
- Wide depth range

Potential Anthropogenic Threats

- Commercial fishing
- Recreational fishing
- Seafloor bottom contact
- Coastal runoff
- Localized depletion of forage base

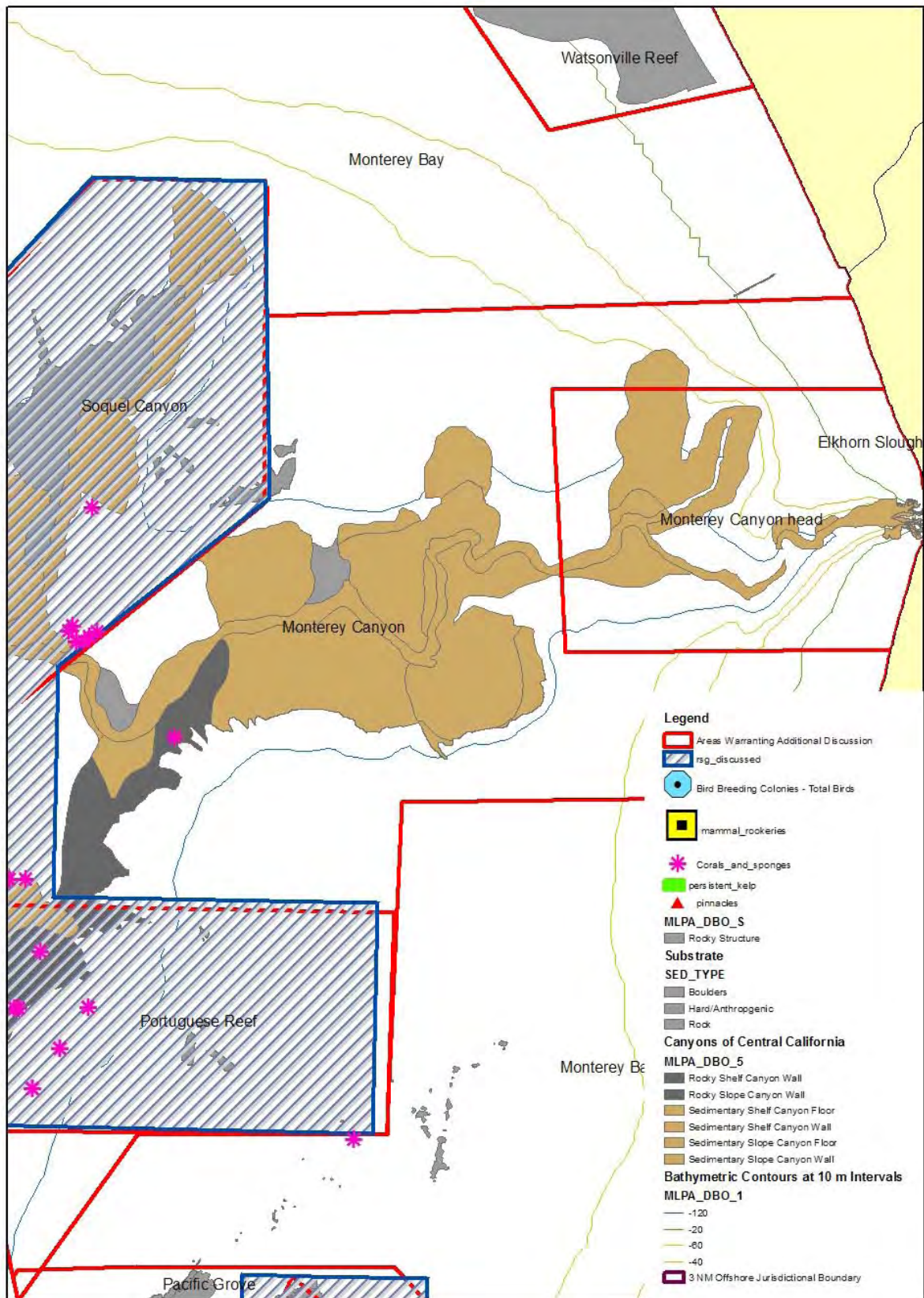
Management Objectives

- Protect seafloor and other biogenic habitat
- Protect benthic invertebrates and groundfish
- Protect forage base for top predators

Recommended Management Measures:

- Coastal Pelagic Species harvest prohibited
- Commercial groundfish harvest prohibited
- Bottom contact with commercial fishing gear (excluding Dungeness crab and prawn pots) prohibited

Map 6: Monterey Canyon



Monterey Peninsula Offshore Reefs

The Monterey Peninsula and Carmel Bay are surrounded by the most extensive complex of rocky substrate in deep and shallow waters, as well as shale beds that host unique species assemblages. Carmel Bay also includes numerous offshore pinnacles.

Key Ecological Features

- Largest reef complex on Central Coast
- Unique geology (i.e. granite outcrops/shale beds)
- Rocky reefs at various depths
- Unique invertebrate assemblages
- High fish/bird diversity
- Habitat for overfished groundfish
- High density of pinnacles
- Offshore rocky canyon

Potential Anthropogenic Threats

- Commercial fishing
- Recreational fishing
- Seafloor bottom contact

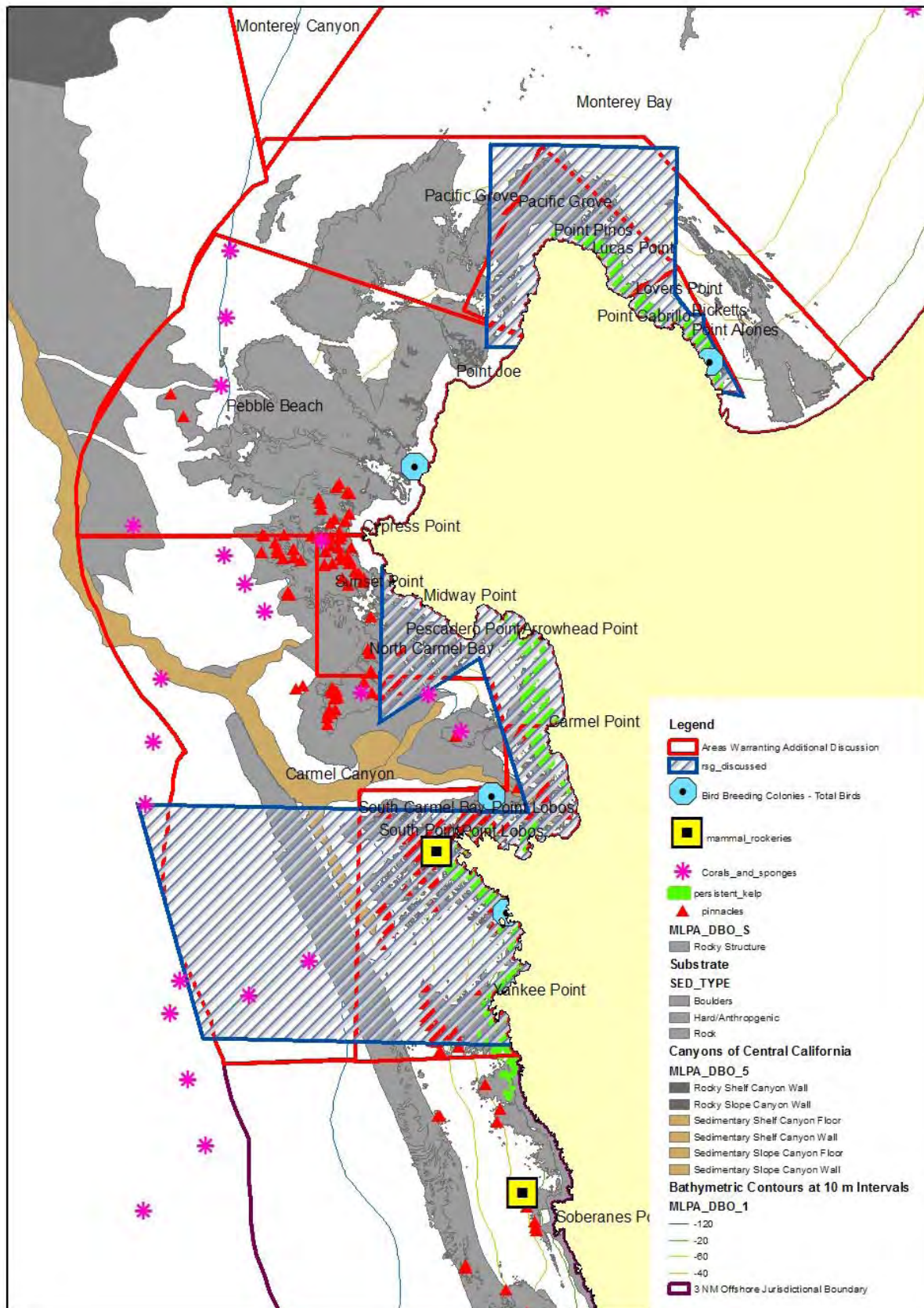
Management Objectives

- Protect seafloor and other biogenic habitat

Recommended Management Measures

- Bottom contact with commercial fishing gear (excluding Dungeness crab and prawn pots) prohibited
- Commercial kelp harvest prohibited

Map 7: Monterey Peninsula Offshore Reefs



Hurricane Point/Castle Rock Seabird Complex

This complex of nearshore rocks and mainland cliffs hosts one of the most diverse assemblages of seabirds between the Farallon and Channel Islands, including Common Murre, Brandt's Cormorant, Pelagic Cormorant, Pigeon Guillemot, Cassin's Auklet, Western Gull and the rare Ashy Storm-Petrel. The Common Murre colony is the southernmost of the species. This murre colony declined by about 60% in the 1980s as a result of gill-net and oil spill mortality. Many efforts are being expended to protect and restore this colony to its former size. The colony has been increasing since the early 1990s, but is still well below where it was in the early 1980s. The colony is very sensitive to human disturbance. Close approach by boats has caused birds to flush off the rocks during the breeding season, and nests have been lost as a result. Forage fish important to the seabirds nesting on the rocks include rockfish, anchovies, sardines, and squid. This colony typically experiences lower breeding success than other central California colonies, and prey base may be a factor.

Key Ecological Features

- Major sensitive seabird colony including common murre
- Nearshore rocky reefs
- High fish/bird diversity

Potential Anthropogenic Impacts

- Commercial fishing
- Recreational fishing
- Kelp harvesting
- Seafloor bottom contact
- Vessel disturbance
- Depletion of forage base

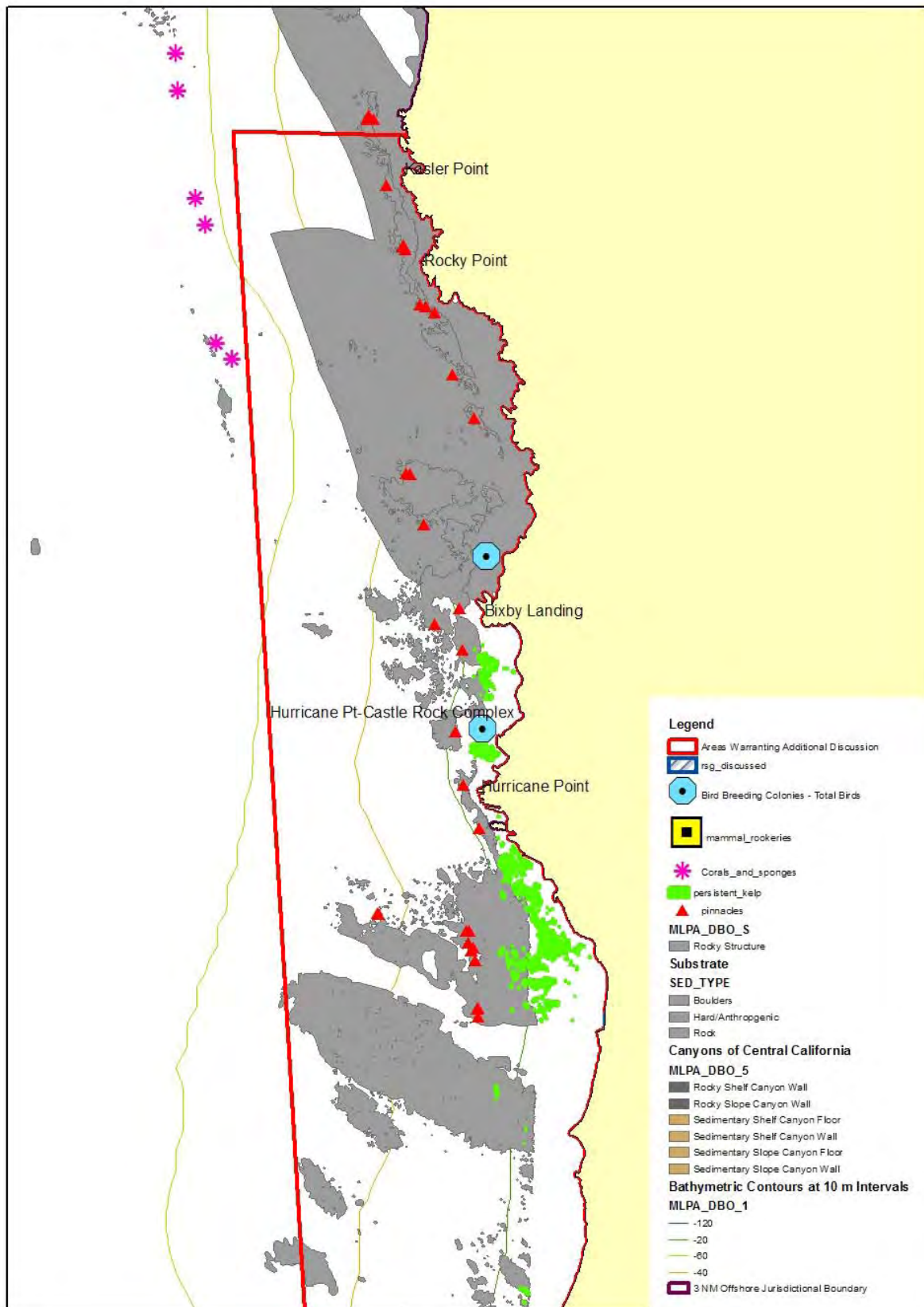
Management Objectives

- Protect seabird/mammal colonies from human disturbance
- Protect seafloor and other biogenic habitat
- Protect forage base for top predators

Recommended Management Measures

- Recreational groundfish take limited and monitored to ensure production of large, old, reproductive fish as identified by Berkley et al. (2004)
- No vessel traffic within ¼ mile from shore
- Coastal Pelagic Species harvest prohibited
- Bottom contact prohibited
- Commercial kelp harvest prohibited

• **Map 8: Hurricane Point Castle Rock Seabird Complex**



Cape San Martin

The Cape San Martin region contains diverse marine habitat and many ecologically significant features. The marine waters off Cape San Martin are an upwelling zone. The shelf break is located within 2 miles of shore; as such the region contains a high diversity of habitat as both deep slope and shallow shelf occur within the area. The head of Mill Creek submarine canyon extends into the area. Both shelf and nearshore hard bottom seafloor habitat are present. Persistent kelp beds occur in the nearshore and habitat-forming invertebrates such as sea pens and hexactinellid sponges have been recorded on the shelf and slope. Much of area contains high-suitability habitat for adult and juvenile overfished groundfish species. On the cliffs and offshore rocks are several major nesting seabird colonies including two large colonies of Brandt's cormorant and the second largest colony of western gulls in the Central Coast region. Also in the area are a rookery for northern elephant seals, haulouts for California sea lions and harbor seals, and high relative density of sea otters.

Key Ecological Features

- Major nesting seabird colonies
- Northern elephant seal rookery
- Habitat-forming invertebrates
- Upwelling zone
- High density sea otter habitat
- Overfished groundfish habitat
- Persistent kelp beds
- Nearshore and shelf hard substrate

Potential Threats

- Commercial fishing
- Recreational fishing
- Kelp harvesting
- Seafloor bottom contact
- Vessel disturbance
- Localized depletion of forage base

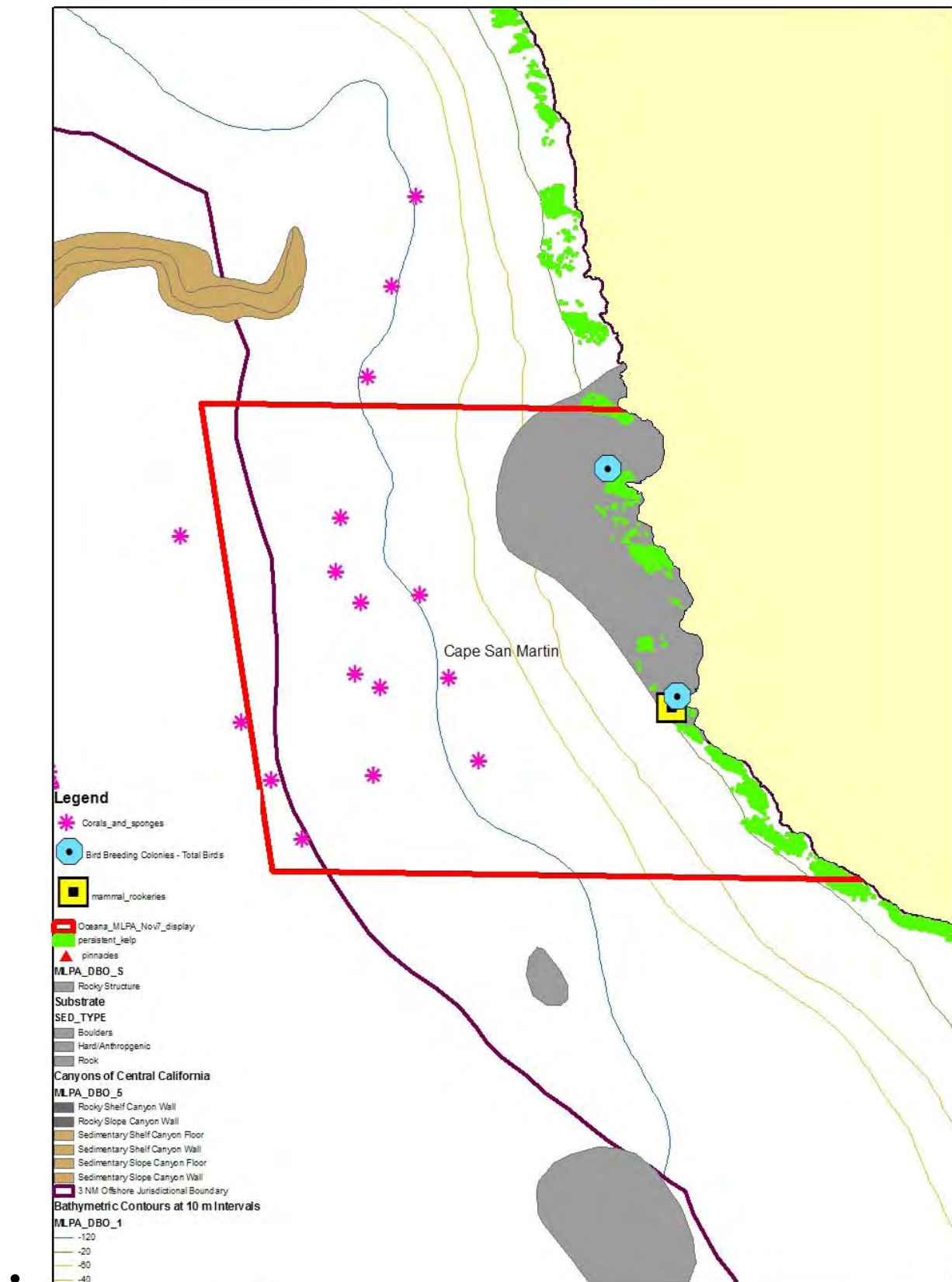
Management Objectives

- Protect benthic invertebrates and groundfish
- Protect seafloor and other biogenic habitat
- Protect seabird/mammal colonies from human disturbance
- Protect forage base for top predators

Recommended Management Measures

- Coastal Pelagic Species harvest prohibited
- Kelp harvesting prohibited
- Bottom contact prohibited
- Commercial groundfish take prohibited
- Recreational groundfish take limited and monitored to ensure production of large, old, reproductive fish as identified by Berkley et al. (2004)

Map 9: Cape San Martin



Pismo-Oceano Beach

This region contains a shallow sandy shelf which is an important foraging area for seabirds. The area attracts tens of thousands of sooty shearwaters, which have declined in California.

Key Ecological Features

- Major seabird staging/feeding area
- Estuary
- Freshwater plume
- High density/diversity of seabirds

Potential Anthropogenic Impacts

- Commercial fishing
- Localized depletion of forage base

Management Objectives

- Improve water quality
- Protect seafloor habitat
- Protect forage base

Recommended Management Measures

- Coastal Pelagic Species harvest prohibited
- Bottom contact prohibited

Point Sal

Rocky reef habitat is located off Point Sal. The waters offshore of Point Sal contain a high diversity of fish species documented from NOAA trawl surveys. Point Sal also has a nesting colony of pigeon guillemots and rhinoceros auklets (a state species of special concern) and is an important pinniped haulout.

Key Ecological Features

- Nearshore hard substrate
- Shelf hard substrate
- Habitat for groundfish

Potential Anthropogenic Impacts

- Commercial fishing
- Recreational fishing
- Seafloor bottom contact

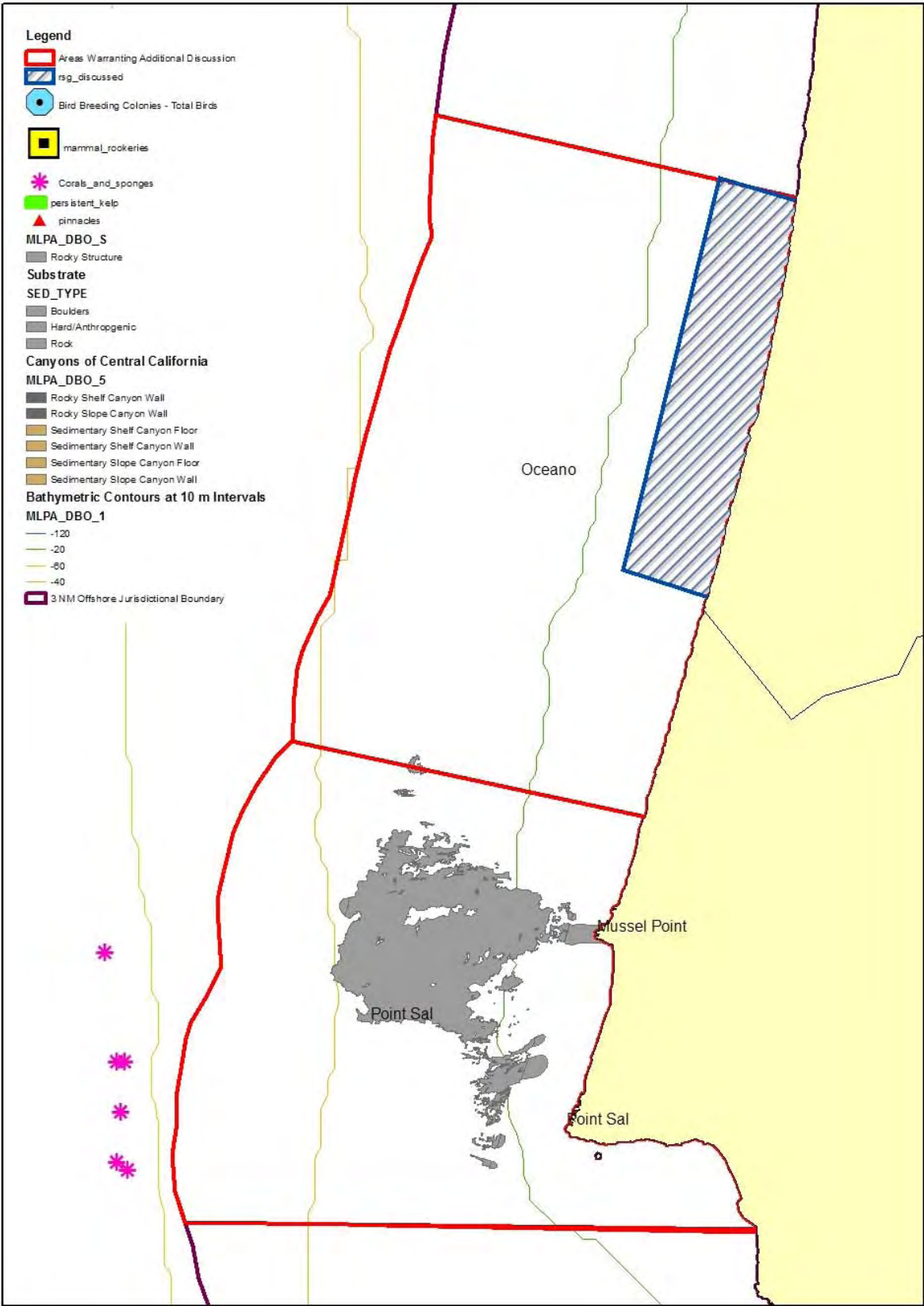
Management Objectives

- Protect seafloor and other biogenic habitat
- Protect benthic invertebrates and groundfish

Recommended Management Measures

- Commercial groundfish take prohibited
- Recreational groundfish take limited and monitored to ensure production of large, old, reproductive fish as identified by Berkley et al. (2004).
- Bottom contact prohibited
- Kelp harvest prohibited

Map 10: Pismo-Oceano and Point Sal



Point Arguello (Safety Zone 5)

The region surrounding Point Arguello is a region of rich biological diversity caused by the meeting of the cold California Current and warmer waters of Santa Barbara Channel. The area is a biogeographic transition zone. Point Arguello has one of the largest colonies of pigeon guillemots in California and is a nesting site for rhinoceros auklets, a state species of special concern. The waters offshore are an important foraging area for thousands of sooty shearwaters, which have declined in recent years. Northern Elephant seals have established a rookery in the area. Vandenberg Military base is located in the area, and restrictions have created a de-facto marine reserve. Nearshore and shelf rocky reefs are home to invertebrates such as red and black abalone, lingcod, and black, blue, brown, copper, olive and vermillion rockfish.

Key Ecological Features

- Major seabird nesting colony
- Important feeding area for seabirds
- Upwelling zone
- Nearshore hard substrate
- Shelf hard substrate
- High density sea otter habitat
- Persistent kelp beds

Potential Anthropogenic Impacts

- Commercial fishing
- Recreational fishing
- Vessel disturbance
- Localized depletion of forage base

Management Objectives

- Protect seabirds and marine mammal colonies from human disturbance
- Protect forage base for top predators

Recommended Management Measures

- Coastal Pelagic Species harvest prohibited

Map 11: Point Arguello

